Project Introduction

In Phase II, the QSI-Vanderbilt team seeks to develop a system-level diagnostics and prognostic process that incorporates a "sense and respond capability," which first uses error codes and discrete sensor values to correctly diagnose the system health including degradations and failures of sensors and components, and then invokes appropriate prognostics routines for the assessment of RUL and performance capability. The QSI-Vanderbilt team plans to emphasize advancement in the following five areas: (a) leverage extensive LADEE telemetry data to further enhance and develop online degradation profiles, performance analysis and remaining useful life (RUL) computation algorithms, (b) develop/implement degradation detection algorithms to compute time-to-alarm (TTA) and time-to-maintenance (TTM) predictions and correlate with alarm/maintenance events, (c) develop reusable library of models and tests, (d) verification and validation of the resulting solution, and (e) demonstrate the proposed solution on LADEE's and other spacecraft subsystems. Once fully developed, outcomes of this effort will lower the cost of developing prognostics and provide maximum critical system availability, smarter scheduling of maintenance, overall logistics support cost, and optimal match of assets to missions. The proposed offering will also provide a cost-effective and pragmatic solution to our commercial customers who want to reduce unscheduled downtime by practicing condition based maintenance, but cannot justify the cost of developing prognostic methods in the conventional way.
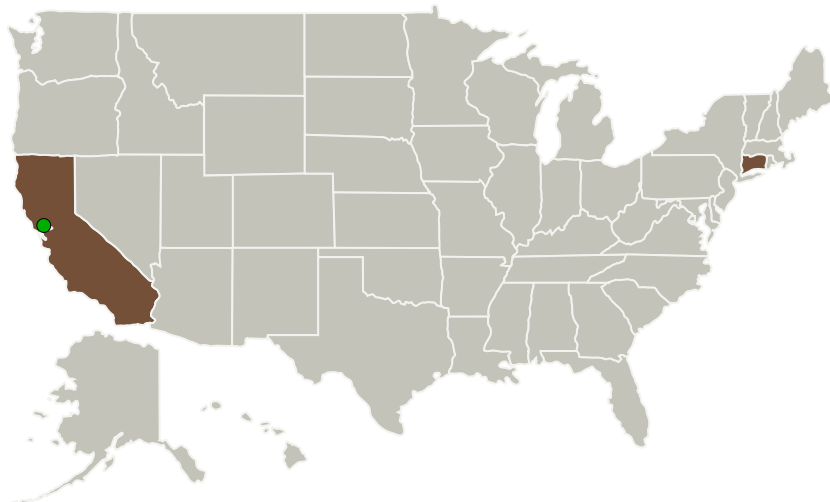
Primary U.S. Work Locations and Key Partners

Diagnosis-Driven Prognosis for Decision Making, Phase II

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Organizations Performing Work	Role	Type	Location
Qualtech Systems, Inc.	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Rocky Hill, Connecticut
●Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Connecticut

Images
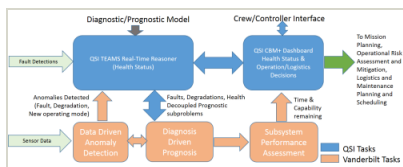
Briefing Chart
Diagnosis-Driven Prognosis for Decision Making Briefing Chart
(https://techport.nasa.gov/image/127908)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Qualtech Systems, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management
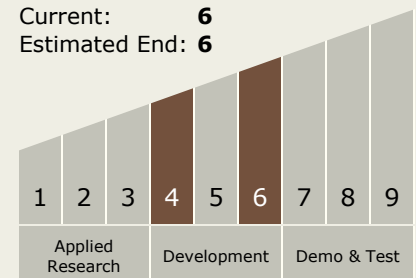
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Somnath Deb

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**

1	2	3	4	5	6	7	8	9
Applied Research			Development			Demo & Test		

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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  └ TX11.4 Information Processing
    └ TX11.4.2 Intelligent Data Understanding

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System